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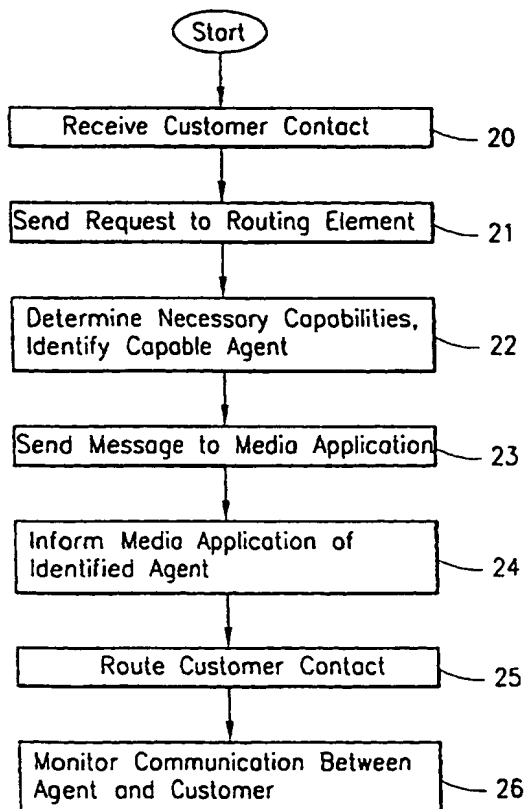
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- (71) Applicant: ERICSSON INC. [US/US]; 7001 Development Drive, P.O. Box 13969, Research Triangle Park, NC 27709 (US).
- (72) Inventor: ANDERSSON, Jason; 11 Corsica, Irvine, CA 92614 (US).
- (74) Agent: VANDYKE, Raymond; Jenkins & Gilchrist, P.C., 1445 Ross Avenue, Suite 3200, Dallas, TX 75202-2799 (US).
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(54) Title: MEDIA COMMUNICATIONS SYSTEM AND METHOD



(57) Abstract: A system and method for handling customer requests for communicating multi-media is disclosed. The system includes a plurality of media applications, each of which allows for communication of at least one type of media with one or more customers. In response to receiving a request from a customer to communicate media with the system, each media application sends request information relating to the request to a routing element. The routing element receives the request information and identifies an available agent for communicating with the customer based upon a comparison of the capabilities needed to communicate therewith to the capabilities of the available agents. The routing element informs the media application of the identified agent. The media application thereafter routes the requesting customer to the identified agent.

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MEDIA COMMUNICATIONS SYSTEM AND METHOD

BACKGROUND OF THE INVENTION

Technical Field of the Invention

The invention relates to a communications handling system and method, and particularly to an integrated system and method for distributing communication of media of a plurality of different types.

Background and Objects of the Invention

In order to effectively handle incoming telephone calls from callers having varying needs, many companies now employ call distribution systems. Call distribution systems typically process incoming voice telephone calls to determine the information requested by the caller, determine the level of skill and capabilities required of an agent to suitably serve the caller, identify those agents who possess the necessary skills and capabilities to serve the caller and route the caller to an identified agent who is available to serve the caller. Conventional call distribution systems, however, are limited in that only incoming voice telephone calls are serviced thereby. Customers wishing to communicate in a format other than through a voice connection and/or wishing to receive information of a type other than voice data are unable to utilize the capabilities that conventional call distribution systems offer.

Today, business entities are increasingly required to provide information to their customers or prospective customers having any of a variety of different forms. For example, companies may find it necessary to provide connections for communicating real time media in addition to providing conventional voice telephone connections. Communicating any of a variety of different types of media, such as voice, video and e-mail, has been the goal of manufacturers from the telecommunications and computer server industries.

One area in which advances have occurred in attempting to provide a system which can handle communication of a variety of different media types is desktop application design. In attempting to provide a desktop application which is capable of communicating media of a plurality of different types, existing desktop applications are custom made based upon the different types of media with which the desktop application is desired to communicate. Desktop applications are generally capable of determining the type of media to communicate with a requesting customer and launching the appropriate application in response. These desktop applications, however, suffer from having to be custom written and potentially requiring the communications system associated therewith to handle the communication of various types of media in a nonuniform manner. In addition, existing desktop applications oftentimes fail to sufficiently inform the routing entity of the communications system

of its status in order for the routing entity to effectively manage the handling of communications connections.

5 A second area in which advances have occurred in attempting to provide a system which can handle communication of a variety of different media types is server design. Server manufacturers have attempted to provide servers which allow multiple applications to share the corporate data infrastructure for communicating voice, video conferencing, and advanced unified messaging. These servers would be capable of handling a potentially wide variety of media types by employment of a series of client-server applications. A significant concern in providing servers of this type, however, is the rather diverse types of media as well as the diverse communication solutions therefor. This concern is further compounded in light of the fact that manufacturers of communications systems typically utilize applications from a number of numerous application providers.

15 It is an object of the present invention to provide a uniform way to handle connections for communicating media of a wide variety of different types.

Another object of the present invention is to provide a communications system which is capable of seamlessly integrating applications from different application providers so that each application communicates within the communications systems in a uniform manner.

It is another object of the present invention to identify a source within a communications system for effectively communicating requested media of any of numerous different types.

5 **SUMMARY OF THE INVENTION**

The present invention overcomes the shortcomings in existing and planned communications systems and satisfies a significant need for an integrated communications system and method for effectively handling connections for communicating media of a plurality of different types.

10 A preferred embodiment of the present invention is directed to a communications system including at least one media application which is utilized by a customer to establish a connection with the communications system for communicating media of a requested type, and to transmit information relating to the connection within the communications system. The communications system further
15 includes a routing element which receives the information relating to the media connection transmitted by the media application. In response to receiving the connection information, the routing element determines the capabilities necessary to communicate the requested type of media with the customer, identifies an available agent who is capable of communicating the requested type of media with the

customer, and informs the media application of the identified agent and location information thereof within the communications system.

5 The routing element preferably includes a database containing a rule set for routing a customer media connection to an agent associated with the communications system. The rule set preferably includes a listing of the capabilities which are necessary in order to suitably communicate media of any of the requested types. The database preferably further includes a listing of the skills and other capabilities of each agent. By accessing the database, the routing element is capable of assigning an agent who may best serve the customer in communicating the media requested
10 thereby.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete understanding of the system and method of the present invention may be obtained by reference to the following Detailed Description when
15 taken in conjunction with the accompanying Drawings wherein:

Figure 1 is a block diagram of a communications system according to a preferred embodiment of the present invention; and

Figure 2 is a flow chart illustrating an operation of the present invention of
Figure 1.

20

DETAILED DESCRIPTION OF THE PREFERRED EXEMPLARY EMBODIMENTS

The present invention will now be described more fully hereinafter with reference to the accompanying drawings in which a preferred embodiment of the invention is shown. This invention may, however, be embodied in many different forms and should not be construed as being limited to the embodiment set forth herein. Rather, the embodiment is provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art.

Referring to Figures 1 and 2, there is shown a communications system 1 for communicating to a requesting customer media of any of a plurality of different types. Communications system 1 includes routing element 2 which performs the tasks necessary to facilitate the routing of a customer media connection to a suitably capable agent 3 associated with communications system 1. Routing element 2 preferably utilizes a skills-based routing approach wherein a customer media connection is routed to an agent 3 from a pool of agents based upon the matching the of capabilities which are necessary to communicate the requested media type with the capabilities possessed by available agents 3, as described below.

Communications system 1 further includes a plurality of media applications 4, each of which is software and/or hardware based and allows for communication of

at least one media type between two entities, such as a customer and an available agent 3. Examples of media applications 4 include an e-mail server for communicating e-mail media, a video server for communicating video media, and a private branch exchange (PBX) for communicating voice or related media. Advantageously, communications system 1 may preferably utilize any media application 4 provided by third-party application providers.

A media application 4 preferably is capable of receiving contact from a customer and sending a request to routing element 2 for sending the contact to a suitable agent 3. The request sent by a media application 4 includes information necessary to route the customer media contact to the suitable agent 3, such as media type to be communicated, contact type and the particular customer requesting the media communication. The type of information in the request sent by a media application 4 preferably is the same regardless of the type of media and/or media application 4. In addition, each media application 4 sends requests and receives responses over an Application Programmers Interface (API) 5.

As stated above, routing element 2 preferably utilizes a skills-based routing approach wherein a customer media connection is routed to an agent 3 from a pool of agents based upon matching the capabilities necessary to communicate the requested media type with the capabilities possessed by available agents 3. Based upon requests received from media applications 4, routing element 2 determines the

capabilities necessary to communicate the requested media type with the requesting customer and identifies an available agent 3 who is capable of communicating the requested type of media with the requesting customer. Upon identifying an available agent 3 who may capably communicate the media type with the requesting customer, routing element 2 replies to the request sent from the media application 4 by sending routing information thereto. The routing information includes the information necessary for the media application 4 to route the customer media contact to the available agent 3 identified by routing element 2.

Routing element 2 preferably includes one or more databases for use in matching the capabilities needed to communicate the type of media requested by the customer with the capabilities of an available agent 3. In particular, routing element 2 includes a database 6 containing a rule set for routing a customer media contact to an agent 3. The rule set may include a listing of the capabilities which are necessary for handling a customer media contact from a particular customer and which are necessary for handling a contact involving a particular type of media.

Moreover, database 6 may include agent definitions for each agent 3 associated with communications system 1. The agent definitions may include a listing of the skills and capabilities possessed by each agent 3. In addition to each agent 3 having a listing of skills possessed thereby, an entry for each agent 3 may include particular skill levels, so that a customer is assigned to the best qualified agent

3. Agent definitions may be organized in database 6 by a prioritized listing of agents 3 for receiving a customer media contact based upon the particular capabilities needed to handle the customer media contact.

5 Database 6 may further include message information which is transferrable to a media application 4 for subsequent transmission to a requesting customer. Depending upon the type of communication requested by a customer, a message may be provided to the corresponding media application 4 which informs the customer of the status of the communication requested thereby.

10 Communications system 1 may further include a database 7 for storing statistical information relating to the handling of the media contacts by communications system 1. Maintaining information regarding each contact handled by communications system 1 allows for the creation of statistical reports of the operation of communications system 1. The reports may be used to track the handling of a single customer media contact or the handling of a group of media contacts
15 relating to a particular type of media or to a particular agent 3. Generated reports may list statistics such as time to communicate with a customer or the time duration in serving a customer. Database 7 preferably is updated by routing element 2 in substantially real time.

20 One benefit in substantially continuously updating database 7 is that agents 3 or other personnel may monitor the assignments performed by routing element 2 in

matching customer media contacts with agents 3. An agent 3, for example, may more effectively manage the handling of customer media contacts by monitoring the number and types of customer media contacts which are routed thereto.

5 The operation in handling an incoming customer communication by communications system 1 will be described with reference to Figure 2. Initially, a media application receives a customer media contact for communicating a particular type of media at step 20. In response, the media application 4 which received the customer media contact sends at step 21 a request to routing element 2 over API 5 to route the customer media contact. The request may include information necessary to
10 allow routing element 2 to assign a capable agent 3, such as the particular type of media to be communicated between the requesting customer and communications system 1 and the identity and location of the requesting customer. Upon receipt of the request from media application 4, routing element 2 determines at step 22 the capabilities necessary to communicate with the customer and identifies an available
15 agent 3 who is capable of communicating the particular type of media corresponding to the customer media contact. The capability determination and the agent identification is made in part by accessing the routing rules and agent definitions stored in database 6.

20 During the capability determination and agent identification steps, routing element may send to media application 4 one or more messages regarding the

handling of the customer media contact at step 23. Message information may be information for subsequent sending by media application 4 to the requesting customer, such as estimated wait time. The messages from routing element 2 are transmitted over API 5.

5 Next, routing element 2 informs media applications 4 of the identified agent 3 at step 24, together with any other information which is necessary to send the customer media contact thereto. This information is also sent over API 5. Thereafter, media application 4 routes the customer media contact to agent 5 at step 25 based upon the information received in step 24.

10 At any time, an agent 3 may monitor in real time customers which have been assigned thereto at step 26 in order to more efficiently provide media communication service.

 A primary benefit of the present communications system 1 and corresponding method is that each media application 4 cooperates with routing element 2 and agents
15 3 in substantially the same way. This uniformity in providing media communication reduces system complexity and promotes easy expandability. As a result, communications system 1 is capable of efficiently handling communication of media of any existing or planned type.

 The invention being thus described, it will be obvious that the same may be
20 varied in many ways. Such variations are not to be regarded as a departure from the

spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

WHAT IS CLAIMED IS:

1. A system for managing customer connections for communicating media of a plurality of different types, comprising:

5 a plurality of applications for receiving contact from customers to communicate media of any of a plurality of different types, and for indicating information relating to the customer contacts; and

10 a router for receiving the indications relating to the customer contacts from the applications, identifying an available agent associated with the system for communicating with each contacting customer, and informing each corresponding application of the identified agent.

2. The system of claim 1, further comprising:

15 an interface for sending each of the indications relating to the customer contacts from the applications to the router, and for sending information relating to the identified agents from the router to the corresponding applications.

3. The system of claim 2, wherein:

the router sends data relating to the status of at least one communication with a customer contact to the corresponding application over the interface.

4. The system of claim 1, wherein:

the router includes a database of the capabilities necessary for communicating media of the types to be communicated with the contacting customers.

5 5. The system of claim 1, wherein:

the router includes a database of capabilities of each agent associated with the system to communicate the different types of media with a customer.

6. The system of claim 1, wherein:

10 the router includes a database of messages relating to the status of a media communication with any of the contacting customers for transmission to the corresponding applications.

7. The system of claim 6, wherein:

15 the applications communicate with the contacting customers messages received from the router relating to the status of the media communication corresponding thereto.

8. The system of claim 1, wherein:

for each contacting customer, the router identifies an agent therefor based upon the agent being capable of communicating media of the type associated with the contacting customer.

5

9. The system of claim 1, wherein:

the router communicates with each identified agent information pertaining to the customer contact to be sent thereto.

10

10. A method of communicating media of a plurality of different types, comprising the steps of:

receiving a contact by an application from a customer to communicate media of at least one of a plurality of different types;

15

identifying an agent available for communicating the media associated with the customer contact, in response to the step of receiving the contact;

informing the application that received the customer contact an indication of the identified agent; and

routing the customer contact by the application to the identified agent.

11. The method of claim 10, further comprising the step of:

sending to the application that received the customer contact status information relating to communication with the contacting customer by an agent.

5 12. The method of claim 11, further comprising the step of:

sending the status information from the application to the contacting customer following the step of sending to the application status information.

13. The method of claim 10, further comprising the step of:

10 maintaining a database of the capabilities necessary for communicating each of the plurality of different types of media;

wherein the step of identifying an agent available for communicating the media includes the steps of accessing the database for one or more capabilities necessary for communicating media of the type associated with the contacting customer, and identifying an agent based upon the capabilities accessed from the database.

15

14. The method of claim 13, further comprising the step of:

maintaining a database of the capabilities of agents from a pool of agents;

wherein the step of identifying an agent available for communicating the media associated with the customer contact includes the steps of accessing the database for agent capabilities and identifying an agent having the capabilities necessary to communicate the media of the type associated with the contacting customer based upon the accessed agent capabilities.

15. The method of claim 15, further comprising the step of:
monitoring communication of media with the contacting customer in substantially real time.

10

16. The method of claim 10, wherein:
the step of receiving a contact comprises the step of receiving contact by any of a plurality of applications from a customer to communicate media.

15 17. A system for communicating multi-media with a customer, comprising:

a media application for receiving from a customer a request to communicate media therewith and sending customer request information, the media application being capable of communicating the type of media requested by the customer; and

a routing element for receiving the request information from the media application, identifying an available agent associated with the system based upon the request information, and sending agent information relating to the identified available agent to the media application;

5 wherein the media application routes the customer to the identified agent in response to the agent information sent by the routing element.

18. The system of claim 17, further comprising:

 a plurality of media applications, each media application being capable of
10 handling a distinct type of media.

19. The system of claim 18, further comprising:

 a database containing a listing of capabilities necessary for communicating
each distinct type of media with a customer, the database being accessible by the
15 routing element.

20. The system of claim 19, wherein:

 the database contains a listing of agent capabilities of each agent associated
with the system to communicate the distinct types of media with a customer.

20

21. The system of claim 20, wherein:

the routing element identifies the available agent based upon a comparison of the capabilities needed to communicate the requested media with the agent capabilities of available agents.

5

22. The system of claim 18, wherein:

each of the media applications communicates with the routing element over an Applications Programmers Interface.

10

23. The system of claim 17, wherein:

the routing element identifies the available agent using a skill-based identification.

24. The system of claim 17, further comprising:

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a database for storing at least one message relating to the status of the customer request, for transmittal to the media application.

25. The system of claim 17, further comprising:

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a database for maintaining information relating to communication with the requesting customer.

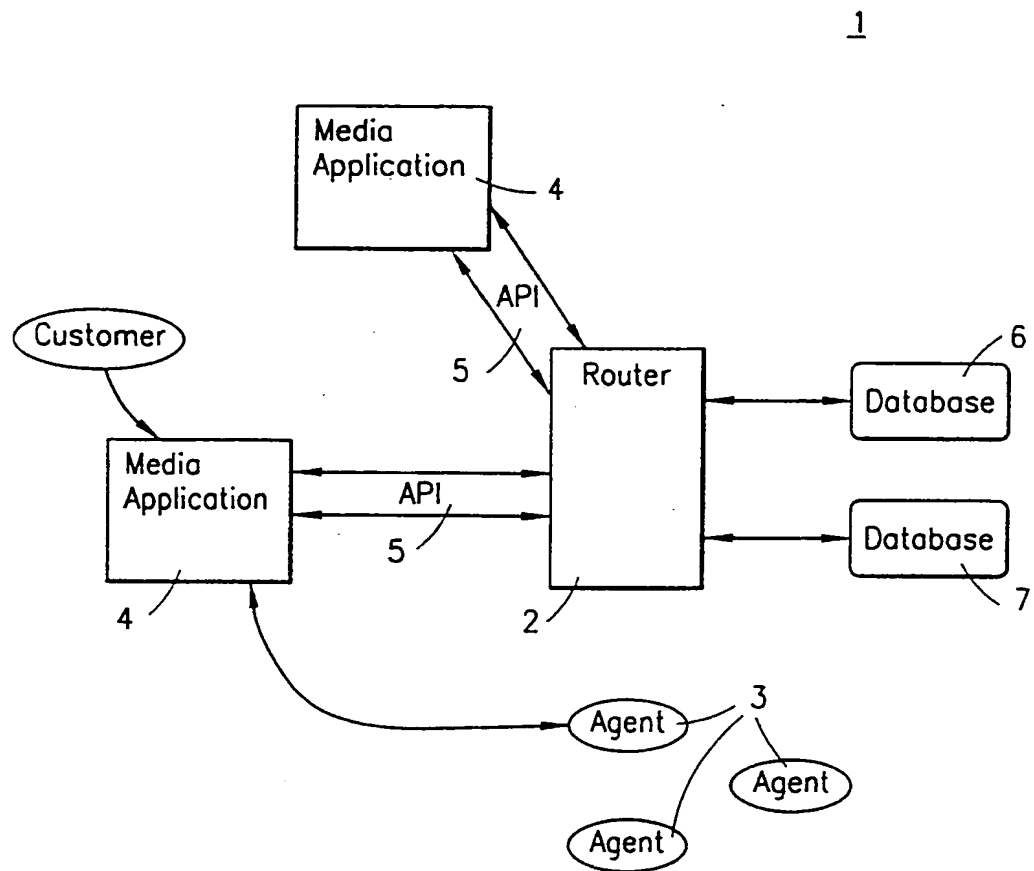
26. The system of claim 25, wherein:

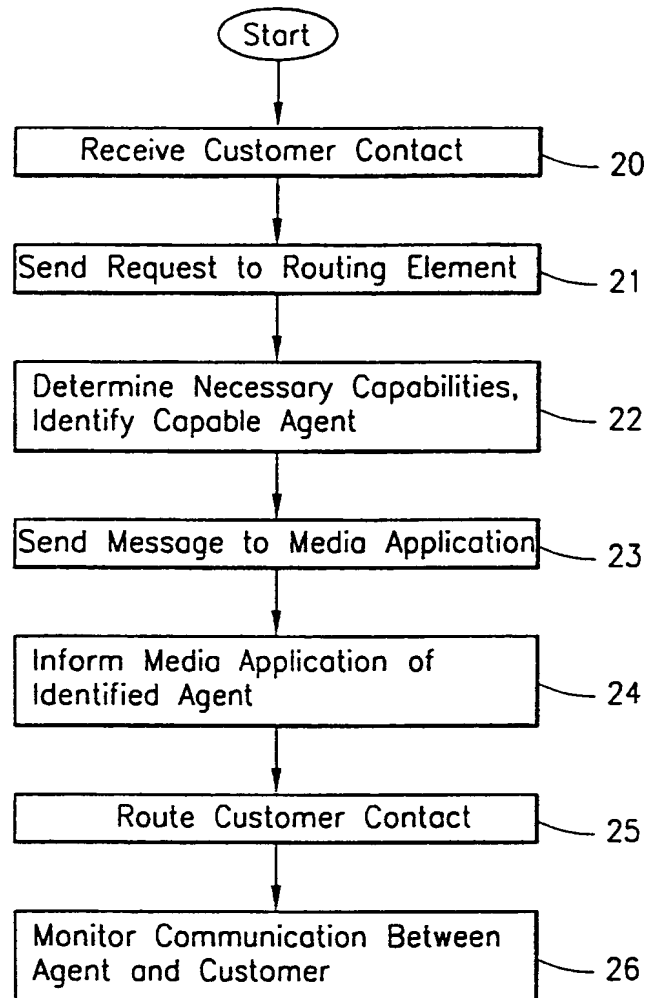
an agent associated with the system may access the database in substantially real time.

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27. The system of claim 17, wherein:

the routing element sends data relating to the request for media communication to the identified agent.

**FIG. 1**

*FIG. 2*

INTERNATIONAL SEARCH REPORT

In ational Application No

PCT/US 00/17399

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04M3/51 H04L29/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04M H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	abstract; figure 1 column 3, line 44 -column 6, line 16	
Y	EP 0 740 450 A (SIEMENS ROLM COMM INC ;IBM (US)) 30 October 1996 (1996-10-30)	23
A	abstract; figure 1 page 10, line 44 -page 10, line 52 page 12, line 10 -page 12, line 42 page 13, line 5 -page 13, line 10 page 17, line 47 -page 18, line 5 -/--	1-22, 24-27

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- *A* document defining the general state of the art which is not considered to be of particular relevance
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- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *8* document member of the same patent family

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Stergiou, C

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/17399

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 99 14920 A (GENESYS TELECOMM LAB INC) 25 March 1999 (1999-03-25) abstract; figure 1 page 1, line 15 - line 26 page 2, line 13 - line 18 page 3, line 8 - line 11 page 5, line 28 -page 6, line 4</p>	1-27
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Information on patent family members

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